



TOWN OF MERRIMACK, NH

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November 1, 2019

Ms. Catherine Beahm
SIP Planning Administrator
NHDES/Air Resources Division
29 Hazen Drive, PO Box 95
Concord, NH 03302-0095

Dear Ms. Beahm:

The Town of Merrimack would like to provide comments on the draft permit and engineering summary for Saint Gobain Performance Plastics Corporation. The comments provided below are for both the engineering summary and the draft permit. The Town of Merrimack would like to thank the New Hampshire Department of Environmental Services for prescheduling a public hearing regarding the draft permit.

Item1 - Engineering Summary – RTO Control Efficiency – Per the engineering summary “control equipment has not historically been evaluated for PFC removal, the control effectiveness values are based on typical VOC control values.... Information obtained on VOC control effectiveness comes from EPA Air Pollution Control Technology Fact Sheets and EPA Control Techniques for VOC Emissions from Stationary Sources.”

Table 4 – Best Available Control Technology (BACT) Analysis						
Potentially Available Control Options	Technically Feasible? (Y/N) ¹¹		Typical VOC Control Effectiveness ¹²	Evaluate Most Effective Controls		
				Energy Impact	Environmental Impacts	Cost Effectiveness
Regenerative Thermal Oxidizer (RTO)	Pollutants are oxidized at high temperature to form combustion products	Y – Provides projected high destruction efficiency with best thermal efficiency of the oxidizer options	95 – 99%	Significant amount of natural gas and electricity	Resulting in emissions of criteria pollutants including NO _x , VOCs and CO ₂	\$46,700/lb

Per USEPA Technical Brief, (https://www.epa.gov/sites/production/files/2019-09/documents/technical_brief_pfas_incineration_ioaa_approved_final_july_2019.pdf):

“For unimolecular decomposition, fluorinated organic compounds require temperatures above 1,000°C to achieve 99.99% destruction in 1 second residence time. Unimolecular decomposition of highly fluorinated organics most likely occurs through breakage of C-C or C-F bonds (Tsang et al., 1998).....Limited studies on the thermal destructibility of fluorotelomer-based polymers found no detectable levels of perfluorooctanoic acid after 2 second residence time and 1,000°C (Yamada et al., 2005; Taylor et al., 2014).”

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Based on the above temperature of 1000 °C (1832°F) a residence time of 1 second is required. The Town is not sure why a residence time of 0.75 seconds was selected. The Town recommends that stack testing be conducted at variety of residence times including:

- 0.75 seconds – included in the permit;
- 1 second; and
- 2 seconds.

This will allow the determination if the removal efficiency increases with increased residence time.

Item 2 – Engineering Summary – 90% Control efficiency for RTO.

For the purpose of the air deposition modeling conducted by Barr, the RTO was assumed to destroy 90% of all PFAS. Per the engineering summary:

Table 11 – PFC Maximum Predicted Deposition Rate Analysis Post RTO Installation							
PFC	Emission Rate (lb/yr)	Controlled Emission Rate (lb/yr) ⁴¹	Modeled Annualized Emission Rate (lb/hr)	Modeled Annualized Emission Rate (g/s)	Maximum Deposition Rate ⁴² (Method 2) (µg/m ² /yr)	Maximum Concentration of PFC Infiltrating to Groundwater (ppt)	Method Detection Limit for Lab Analysis ⁴³ (ppt)
PFOA	0.74	0.074	8.45E-06	1.06E-06	0.411	0.775	0.79
PFNA	0.19	0.019	2.17E-06	2.73E-07	0.105	0.198	0.25
PFHxS	0.041	0.0041	4.68E-07	5.90E-08	0.0228	0.043	0.16
PFOS	0.045	0.0045	5.14E-07	6.47E-08	0.025	0.047	0.50

“In the May 30, 2019 SGPP air deposition modeling report, Barr referenced the 2018 Barr modeling report in which historical air emissions from SGPP were modeled to predict groundwater impacts from air deposition modeling results. Barr states that based on the methodology presented in that report, the values of maximum deposition rate of each compound listed in Table 11 **above would not be likely to result** in an exceedance of a current AGQS or MCL.”

It is not clear how the New Hampshire Department of Environmental Services Air Resources Division (NHDES) arrived at a control efficiency of 90%. Given the recently promulgated MCL's and the 89 PFAS compounds that were tentatively identified by EPA ORD in Report #6, the Town questions a permit standard based on a “not likely” to exceed concept. Provide additional data or evaluations which will definitely confirm if a 90% efficiency will comply with the recently promulgated MCL/AGQS.

Item 3 – Engineering Summary - Maximum annual limits .

Table 11 – PFC Maximum Predicted Deposition Rate Analysis Post RTO Installation							
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PFOS	0.045	0.0045	5.14E-07	6.47E-08	0.025	0.047	0.50

Per the engineering summary,

“The maximum annual controlled PFC emission limits are 0.075 lbs/yr PFOA, 0.048 lbs/yr PFOS, 0.024 lbs/yr PFNA, and 0.015 lbs/yr PFHxS.”

These limits are higher than the controlled emission rate in the Table 11. Best Available Control Technology (BACT) means an emission limitation based on the maximum degree of reduction which is achievable for each pollutant, taking into account energy, environmental, and economic impacts, and other costs. Therefore, the limits should be the same as those presented in Table 11.

Item 4 – Engineering Summary - Per the Engineering Summary.

“Given the possible issues associated with calculation of control efficiency as explained in #1 above, an alternative post-controlled emission limitation for PFOA, PFOS, PFNA and PFHxS was established based on the detection levels for PFAS observed during the three most recent stack tests conducted at SGPP. The samples collected during these stack tests were analyzed by two different labs and represent samples that were taken both with and without the use of an XAD resin. Typical detection levels of 1.0E-12 lb/dscf were seen and given the proposed maximum air flow of 70,000 scfm for the proposed RTO, this equates to a post-controlled emission level of 4.0E-06 lb/hr for each PFC.”

Based on a limit of 0.000004 lb/hr for each PFAS for which an MCL has been established, the maximum number of hours which the facility could operate is as follows:

- PFOA - 0.075 lbs/yr – 8760 hours;
- 0.048 lbs/yr PFOS – 8760 hours;
- 0.024 lbs/yr PFNA ~ 6000 hours; and
- 0.015 lbs/yr PFHxS ~ 3750 hours.

Provisions should be made in the permit to limit the hours of operations based on the potential to exceed the standards. In addition, if Saint Gobain is not tracking PFAS content in their raw materials then the maximum hours of operation should be 3,750 hours to ensure that they do not exceed the lbs/year emission for PFHxS. It should be also noted that the standards used above do not reflect BACT standards identified in Table 11 of the engineering summary.

Item 5 – Engineering Summary - The dip pan results were not included in the engineering summary.

The Barr Engineering (Barr) report, “Results of the April 26-27, 30 and May 1-2, 2018 PFAS Emissions and RTAP Tests Performed on the MA, MS and QX Towers at Saint-Gobain Performance Plastics” provided results from the dips pans analyzed at the QX Tower. The results from the QX Tower identified concentrations of 25,600 ppt and 21,100 ppt for PFOA. The same samples reported 160,000 ppt and 128,000 ppt for PFNA, respectively. Barr Engineering reviewed the data and determined that the results for PFOA may be positively biased (20,000 ppt instead of 25,600 ppt) but the result when using a conservative approach is still valid.

The PFNA results were an order of magnitude higher than the PFOA results, 160,000 ppt and 128,000 ppt. Please remember that the **AGQS for PFNA is 11 ppt**. These results should have been included in the engineering summary. In addition, Saint Gobain should be required to sample dip pans as part of their stack testing protocol.

Item 6 – Engineering Summary – Hydrogen Fluoride emission rate per the Engineering Summary is:

Table 12 – Env-A 1400 RTAP Maximum Predicted Concentration Analysis								
RTAP	CAS #	Emission Rate (lb/hr)	Maximum Predicted Impact (µg/m ³)		Ambient Air Limits (µg/m ³)		Complies with AAL?	
			Annual	24-hr	Annual	24-hr	Annual	24-hr
Hydrogen Fluoride (as F)	7664-39-3	0.24	0.16	1.24	0.98	1.5	Yes	Yes ⁴⁴

In addition NHDES states:

“Maximum predicted 24-hr impact is 83% of 24-hr AAL. As noted in the June 20, 2019 NHDES letter to SGPP regarding the EPA ORD analytical results, NHDES believes the quantification of the 89 PFAS compounds that were tentatively identified by EPA ORD in Report #6 is an underestimation of the current PFAS emissions from the facility and by default, an underestimation of the potential HF (as F) emissions from the proposed RTO.”

Hydrogen Fluoride (HF) differs from other acids because it readily penetrates the skin and dissociates into fluoride ions, causing destruction of deep tissue layers, including bone. Pain associated with skin exposure to HF may not occur for 1-24 hours. Unless you can rapidly neutralize the HF and bind the fluoride ions, tissue destruction may continue for days and result in limb loss or death. Hydrofluoric acid vapors are also an inhalation hazard and can cause ocular irritation.

It is important for a risk analysis to distinguish between normally healthy individuals and those with compromised health or children. Exposure to higher concentrations of HF would be expected to be tolerated more in healthy individuals, whereas, at equal concentrations, impairing effects may occur in those with compromised health. Therefore, as with the toxicological evaluations conducted to develop the MCLs, sensitive receptors should also be considered with regard to HF emissions. Given the acute toxicity of HF, the Town strongly recommends that additional calculations be conducted to determine if a scrubber is required.

Item 7 – Temporary Permit – Table 5, Item 5(f) & (g):

As discussed in item 2 above, it is not clear how the New Hampshire Department of Environmental Services Air Resources Division (NHDES) arrived at a control efficiency of 90%. Given the recently promulgated MCL's and the 89 PFAS compounds that were tentatively identified by EPA ORD in Report #6, the Town questions the a permit standard based on a "not likely" to exceed. Provide additional data or evaluations which will definitely confirm if a 90% efficiency will comply with the recently promulgated MCL/AGQS.

Item 8 – Temporary Permit – Table 5, Item 5(i): "The Facility shall follow the Roof Cleaning SOP submitted December 20, 2018 and the procedures for roof inspections, cleanings and maintenance of stormwater systems detailed in a submittal dated January 22, 2018."

On September 10, 2018, Golder sampled stormwater discharges from the roof-drains, stormwater conveyance system at MH-5, MH-23, and Outfall 001. PFOA concentrations in samples collected from MH-23 were up to 3,000 ppt and up to 20,000 ppt in MH-5. **The highest roof drain concentration of PFOA was 52,000 ppt in roof drain RD-ME-NE. This same roof drain contained PFOS up to 6,300 ppt. The concentrations of PFOA identified at Outfall 001 which discharges into the Merrimack River ranged from 7,900 ppt to 9,400 ppt.** The PFOS concentration at Outfall 001 ranged from 1,600 ppt to 1,800 ppt. The roof cleaning procedures are ineffective. Saint Gobain should be required to evaluate additional alternatives to prevent the discharge on heavily contaminated runoff from their site to the environment.

Item 9 – Temporary Permit – Table 6, Item 3:

"Until PCE01 is installed and operational, the owner or operator shall perform daily (during normal business hours Monday-Friday) observations of EU01-EU80, EU12, EU13, EU15-EU17...."

EU80 should be EU08.

Item 9 - Temporary Permit – Table 6 Item 11 & Item 13

Table 6 - Monitoring and Testing Requirements

Item #	Parameter	Method of Compliance	Frequency	Applicable Unit	Regulatory Basis
11.	Thermal Oxidizer Combustion Temperature	a.) Monitor the thermal oxidizer combustion chamber temperature at least once every 15 minutes and record the hourly average temperature. b.) If the average hourly temperature reading is less than the minimum specified in Table 5, Item 5.c, then inspect the unit and take corrective action to raise the temperature. c.) If the average hourly temperature cannot be brought back up within 48 hours of the excursion ⁷ , then maintain records of the excursion pursuant to Table 7, Item 15.	Monitor every 15 minutes when the associated process is operating As noted	PCE01	RSA 125-C:6, XI Env-A 906 & Env-A 911.03(b)

Table 6 - Monitoring and Testing Requirements

Item #	Parameter	Method of Compliance	Frequency	Applicable Unit	Regulatory Basis
13.	Air Pollution Control Equipment Monitoring Plan	<u>Start-up and Shutdown Requirements</u> a.) The owner or operator shall not initiate process operations with perfluorinated compounds prior to the RTO (PCE01) reaching the established operational temperature required in Table 5, Item 5c. b.) During any shutdown condition, process operations will proceed to a safe stopping point to minimize potential emissions.	Continuous	PCE01	RSA 125-C:10-e Env-A 810.01 & Env-A 910.01

Item 11 (b) and (c) appear to contradict Item 13. The facility should not be allowed to initiate operations with PFAS if the RTO cannot maintain the require temperature of 1800°F. While the Town understands that the facility should be allowed to work through operational issues, a shutdown provision should be required.

Item 10 – Temporary Permit – Table 6 Item 14

Saint Gobain should be required to sample dip pans as part of their stack testing protocol.

Item 11 – Temporary Permit – Table 6 Item 17

NHDES in their September 26, 2018 letter to Saint Gobain stated:

“.... NHDES has concluded that devices operated at” Saint Gobain ” have and continue to emit to the air PFCs and potentially precursors that have caused and continue to contribute to an exceedance of AGQS as a result of deposition of the PFCs and precursors from the air and as such are subject to the requires of RSA 125-C:10-e.”

Therefore, stack testing should include not only PFOA, PFOS, PFNA, and PFHxS but all the precursors as required.

Item 12 – Temporary Permit – Table 7 Item 6:

Recommend adding to VOC record keeping requirements any known information (sampling of vendor supplied raw materials or sampling dip pans) on the presence of PFAS compounds.

Item 13 – Temporary Permit – Table 8 Item 5B

Given the acute toxicity of HF, the Town strongly recommends that additional calculations be conducted to determine if a scrubber is required. Waiting for several years to install a scrubber after the operation of the RTO is unacceptable because HF would continue to be discharged at potentially unacceptable levels.

Item 14 – Temporary Permit – Item 10(j)(2)

This condition would allow Saint Gobain to re-sample their roof drains in the summer of 2021. As stated in item 8, the roof cleaning procedures are ineffective. Saint Gobain should be required to evaluate additional alternatives up to and including replacement of the existing roof membrane to prevent the discharge on heavily contaminated runoff from their site to the environment.

Please do not hesitate to contact the Town of Merrimack should you have any questions on the above comments.

Sincerely,



Eileen Cabanel
Town of Merrimack Town Manager

Cc: